Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)

PROGRAM SOLICITATION
NSF 14-513

REPLACES DOCUMENT(S):
NSF 13-516

National Science Foundation

Directorate for Education & Human Resources
    Division of Human Resource Development

Letter of Intent Due Date(s) *(required)* (due by 5 p.m. proposer's local time)*:*

December 18, 2013

    Letters of Intent are due for Targeted Infusion Projects, Broadening Participation Research Projects, Achieving Competitive Excellence Implementation Projects and Implementation Projects

August 25, 2014

    Letters of Intent are due for Research Initiation Awards

November 24, 2014

    Letters of Intent are due for Targeted Infusion Projects, Broadening Participation Research Projects, Achieving Competitive Excellence Implementation Projects and Implementation Projects

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

February 18, 2014

    Proposals are due for Targeted Infusion Projects, Broadening Participation Research Projects, Achieving Competitive Excellence Implementation Projects and Implementation Projects

October 27, 2014

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January 26, 2015

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IMPORTANT INFORMATION AND REVISION NOTES

This solicitation has been revised to incorporate into the Other Information section a newly issued publication jointly developed by the National Science Foundation and the Institute of Education Sciences in the U.S. Department of Education entitled, *Common Guidelines for Education Research and Development*. The *Guidelines* describe six types of research studies that can generate evidence about how to increase student learning. Research types include those that generate the most fundamental understandings related to education and learning; examinations of associations between variables; iterative design and testing of strategies or interventions; and assessments of the impact of a fully-developed intervention on an education outcome. For each research type, there is a description of the purpose and the expected empirical and/or theoretical justifications, types of project outcomes, and quality of evidence.

The *Guidelines* publication can be found on the NSF website with the number NSF 13-126 (http://www.nsf.gov/pubs/2013/nsf13126/nsf13126.pdf). A set of FAQs regarding the *Guidelines* are available with the number NSF 13-127 (http://www.nsf.gov/pubs/2013/nsf13127/nsf13127.pdf). Grant proposal writers and PIs are encouraged to familiarize themselves with both documents and use the information therein to help in the preparation of proposals to NSF.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Historically Black Colleges and Universities - Undergraduate Program (HBCU-UP)

Synopsis of Program:

Historically Black Colleges and Universities (HBCUs) have awarded a large share of bachelor's degrees to African American students in science, technology, engineering and mathematics (STEM), and nine of the top ten baccalaureate institutions of African American STEM doctorate recipients from 2006-2010 are HBCUs. [1] To meet the nation's accelerating demands for STEM talent, more rapid gains in achievement, success and degree production in STEM for underrepresented minority populations are needed. The Historically Black Colleges and Universities Undergraduate Program (HBCU-UP) is committed to enhancing the quality of undergraduate STEM education and research at HBCUs as a means to broaden participation in the nation's STEM workforce. To this end, HBCU-UP provides awards to develop, implement, and study evidence-based innovative models and approaches for improving the preparation and success of HBCU undergraduate students so that they may pursue STEM graduate programs and/or careers. Support is available for Targeted Infusion Projects, Broadening Participation Research Projects, Research Initiation Awards, Implementation Projects or Achieving Competitive Excellence Implementation Projects, and other funding opportunities.

Targeted Infusion Projects (TIP) provide support to achieve a short-term, well-defined goal to innovate or improve the quality of undergraduate STEM education at HBCUs. The Broadening Participation Research (BPR) in STEM Education track provides support for research projects that seek to create and study new theory-driven models and innovations related to the participation and success of underrepresented groups in STEM undergraduate education. Research Initiation Awards (RIA) provide support for STEM faculty at HBCUs to pursue research at the home institution or at an NSF-funded research center, a research intensive institution or a national laboratory. Implementation Projects provide support to design, implement, study, and assess comprehensive institutional efforts to increase the number of students receiving undergraduate degrees in STEM and enhance the quality of their preparation by strengthening STEM education and research. Within this track, Achieving Competitive Excellence (ACE) Implementation Projects are intended for HBCUs with exemplary achievements and established institutionalized foundations from previous Implementation Project grants.

[1] National Science Foundation, National Center for Science and Engineering Statistics. 2013. *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2013*, Special Report NSF 13-304. Arlington, VA. Available from http://www.nsf.gov/statistics/wmpd/ .

Cognizant Program Officer(s):

Please note that the following information is current at the time of publishing. See program website for any updates to the points of contact.

- Claudia Rankins, Program Director, 815N, telephone: (703)-292-8109, fax: (703)-292-9018, email: crankins@nsf.gov

- Earnestine Easter, Program Director, 875N, telephone: (703)-292-8112, fax: (703)-292-9039, email: epsalmon@nsf.gov

- Martha James, Program Director, 815.01, telephone: (703)-292-7772, fax: (703)-292-9018, email: mjames@nsf.gov

- Toni Edquist, Program Specialist, telephone: (703)-292-4649, email: tedquist@nsf.gov

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.076 --- Education and Human Resources

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 78 - In FY 2014, up to 15 Targeted Infusion Projects, up to 6 Broadening Participation Research Projects, up to 6 Implementation Projects, and up to 2 ACE Implementation Projects. In FY 2015, up to 15 Targeted Infusion Projects, up to 6 Broadening Participation Research Projects, up to 6 Implementation Projects, up to 2 ACE Implementation Projects and up to 20 Research Initiation Awards.

Anticipated Funding Amount: $33,400,000

Approximately $14.7 million in FY 2014 for new awards in the tracks: Targeted Infusion Projects, Broadening Participation Research Projects, Implementation Projects, and ACE Implementation Projects pending the availability of funds. Additionally, $18.7 million, pending availability of funds, for new awards in FY 2015 for Targeted Infusion Projects, Broadening Participation Research Projects, Implementation Projects, ACE Implementation Projects, and Research Initiation Awards.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- **HBCU-UP Proposals:** Historically Black Colleges and Universities (HBCUs) that are accredited and offer undergraduate educational degree programs in science, technology, engineering and mathematics (STEM).

PI Limit:

- The Principal Investigator for a **Targeted Infusion Project** should be the individual who will direct the implementation of the project activities.
- The Principal Investigator for a **Broadening Participation Research Project** should be responsible for managing the project and should be one of the key researchers. At least one of the Principal Investigators must have experience in education or social science research.

- The Principal Investigator for a **Research Initiation Award** should be a faculty member in a STEM discipline at the HBCU. Co-Principal Investigators and senior personnel are not permitted.
- The Principal Investigator and co-Principal Investigators for the **Implementation Project and ACE Implementation Project** should be the key personnel that will be responsible for guiding the implementation of the project.

Limit on Number of Proposals per Organization:

HBCU-UP Proposals:

- An eligible institution can only submit one Implementation Project or ACE Implementation Project proposal and can only have one active Implementation Project or ACE Implementation Project award.
- An eligible institution can submit no more than two Broadening Participation Research proposals per year.
- An eligible institution can submit no more than two Targeted Infusion Project proposals per year and can only have one active Targeted Infusion Project for any given department.
- An eligible institution can submit no more than two Research Initiation Award proposals per year.

Limit on Number of Proposals per PI or Co-PI: 2

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is required. Please see the full text of this solicitation for further information.

- **Preliminary Proposal Submission:** Not Applicable

- **Full Proposals:**
    - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg.
    - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)

B. Budgetary Information

- **Cost Sharing Requirements:** Inclusion of voluntary committed cost sharing is prohibited.

- **Indirect Cost (F&A) Limitations:** Not Applicable

- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

- **Letter of Intent Due Date(s)** *(required)* (due by 5 p.m. proposer's local time)*:*

    December 18, 2013

        Letters of Intent are due for Targeted Infusion Projects, Broadening Participation Research Projects, Achieving Competitive Excellence Implementation Projects and Implementation Projects

    August 25, 2014

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Proposal Review Information Criteria

Merit Review Criteria: National Science Board approved criteria. Additional merit review considerations apply. Please see the full

text of this solicitation for further information.

Award Administration Information

Award Conditions: Additional award conditions apply. Please see the full text of this solicitation for further information.

Reporting Requirements: Standard NSF reporting requirements apply.

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I. INTRODUCTION

The Historically Black Colleges and Universities Undergraduate Program (HBCU-UP) is a program in the Division of Human Resource Development in the Directorate for Education and Human Resources. HBCU-UP is committed to enhancing the quality of undergraduate STEM education and research at Historically Black Colleges and Universities (HBCUs) as a means to broaden participation in the nation's STEM workforce. HBCU-UP realizes this purpose by providing awards to develop, implement, and study innovative models and approaches for making dramatic improvements in the preparation and success of HBCU undergraduate students so that they may participate successfully in graduate programs and/or careers in STEM disciplines.

HBCU-UP has identified the following priorities: innovation in instruction and curriculum development; providing access to STEM research experiences for undergraduate students; focusing on recruitment and retention, especially retention in STEM fields during and after the freshman year; critical transitions from K-12 to undergraduate, 2 year to 4 year, and undergraduate to graduate school; increased research capacity of STEM faculty; and STEM teacher preparation.

According to National Science Foundation data [1], black students comprise 2.5% of the B.S. degree recipients in the geosciences, 3% in physics and 4.4% in engineering, while 18-24 year old Blacks or African Americans make up 14.2% of the U.S. population. Therefore, HBCU-UP encourages the submission of innovative projects that offer solutions to the severe underrepresentation of African American students in engineering, the geosciences and physics at the undergraduate level.

HBCU-UP is particularly interested in building knowledge in areas related to the following questions:

- What are the underlying issues affecting the differential participation and graduation rates in STEM undergraduate education of African American students?
- What are effective strategies for improving STEM education in HBCUs? How can these strategies be translated to other institutions?
- What replicable models of successful STEM programs at HBCUs can be developed, described and adopted by other HBCUs and other institutions that serve underrepresented minority students?
- What are effective methods of increasing the capacity of HBCUs to produce more STEM graduates who are highly qualified for the STEM workforce or graduate school?
- What models of collaborations and partnerships that include HBCUs have the greatest short- and long-term positive impact for the HBCU institution, faculty, and/or students?

HBCU-UP's priorities are in alignment with findings and recommendations in some recently published reports. "*Prepare and Inspire:*

K-12 Education in Science, Technology, Engineering, and Math (STEM) for America's Future" [2] provides a strategy for improving STEM education during the first two years of college and stresses that improving student performance in science and mathematics requires an adequate supply of STEM teachers. "*Expanding Underrepresented Minority Participation: America's Science and*

Technology Talent at the Crossroads" [3] explores the role of diversity in the STEM workforce and its value in keeping America innovative and competitive. "*Rising Above the Gathering Storm, Revisited: Rapidly Approaching Category 5"* [4], provides a snapshot of the work of the government and the private sector in recent years, analyzing how the original recommendations have or have not been acted upon, what consequences this may have on future competitiveness, and priorities going forward.

[1] National Science Foundation, National Center for Science and Engineering Statistics. 2013. Women, Minorities, and Persons with Disabilities in Science and Engineering: 2013. Special Report NSF 13-304. Arlington, VA. http://www.nsf.gov/statistics/wmpd/.

[2] The President's Council of Advisors on Science and Technology (2010). Executive Report to the President. *Prepare and Inspire: K-12 Education in Science, Technology, Engineering, and Math (STEM) for America's Future.* http://www.whitehouse.gov/ostp/pcast.

[3] Members of the Committee on Underrepresented Groups and the Expansion of the Science and Engineering Workforce Pipeline (2010). NAS Report. *Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads.* ISBN: 0-309-15969-5. http://www.nap.edu/catalog/12984.html

[4] Members of the 2005 "Rising Above the Gathering Storm Committee" (2010). NAS Report. *Rising Above the Gathering Storm, Revisited: Rapidly Approaching Category 5.* ISBN: 0-309-16098-7. http://www.nap.edu/catalog/12999.html.

II. PROGRAM DESCRIPTION

Historically Black Colleges and Universities (HBCUs) have awarded a large share of bachelor's degrees to African American students in science, technology, engineering and mathematics (STEM), and HBCUs are the baccalaureate origins of one-quarter to one-third of black science and engineering (S&E) doctorate recipients. To meet the nation's accelerating demands for STEM talent, more rapid gains in STEM for underrepresented minority populations are needed. The Historically Black Colleges and Universities Undergraduate Program (HBCU-UP) provides awards to develop, implement, and study innovative models and approaches to make dramatic improvements in the preparation and success of underrepresented minority students to participate in the S&E enterprise. Support is available for Targeted Infusion Projects, Broadening Participation Research Projects, Research Initiation Awards, Implementation Projects/Achieving Competitive Excellence Implementation Projects, and other funding opportunities.

1. TARGETED INFUSION PROJECTS: Projects of two to three years targeted to meet a short-term, well-defined goal to improve the quality of and make innovations in undergraduate STEM education.

Targeted Infusion Projects could create or adapt innovative learning experiences and pedagogies in STEM fields. Projects could develop creative uses of cyberlearning. Projects could enhance academic infrastructure by updating curriculum, modernizing laboratory research equipment, or improving the computational network array for research and education. Projects could enhance existing degree programs, establish new degree programs or concentrations, secure specialized accreditation or certification, or infuse STEM programs with disciplinary field advances and evolving workforce requirements. Projects that develop faculty expertise, promote implementation of educational innovations, or link to the preparation of future K-12 teachers are encouraged. Projects should be guided by research on teaching and learning.

Competitive proposals will describe clearly the innovation in undergraduate STEM education the project will realize. Appropriate short-term goals should be easily measurable and attainable within the project time frame, and appropriate metrics should be identified. The proposal also should include activities for dissemination of project results.

Proposals that include normal operating activities such as salaries to teach existing classes and normal recruitment and outreach activities will not be funded. HBCUs that currently have a five-year Implementation Project will need to explain how the Targeted Infusion Project differs from the Implementation Project activities and how the HBCU-UP funded projects will be leveraged, integrated, or synergized to produce greater outcomes that could not be achieved separately.

2. BROADENING PARTICIPATION RESEARCH IN STEM EDUCATION PROJECTS: Projects of up to three years to conduct a research investigation.

The Broadening Participation Research in STEM Education track exists across programs in the Division of Human Resource Development and may be found in the following solicitations: Alliances for Graduate Education and the Professoriate (AGEP); Centers of Research Excellence in Science and Technology (CREST); Historically Black Colleges and Universities Undergraduate Program (HBCU-UP); Louis Stokes Alliances for Minority Participation (LSAMP); and Tribal Colleges and Universities Program (TCUP). Priorities and restrictions on study populations and awardee institutions may apply depending on the HRD program to which the proposal is submitted.

HBCU-UP Broadening Participation Research (BPR) in STEM Education proposals should be designed to create and study new models and innovations in STEM teaching and learning; enhance the understanding of the underlying issues affecting the differential participation and success rates of students from underrepresented groups; add to the research knowledge base; and inform STEM education practices and interventions. Broadening Participation Research proposals should describe evidence-based research studies that contribute to understanding the participation of and successful outcomes for underrepresented groups in STEM. Proposals should consider new evidence-based strategies and practices and institutional structure models for broadening participation in STEM and increasing the capacity of scholars in minority-serving institutions to conduct this type of research.

Proposed research may investigate behavioral, cognitive, affective, learning and social differences as well as organizational, institutional or systemic processes that may impact participation and success in STEM education. Successful proposals will be grounded in appropriate theory and incorporate recent innovations and advances in research methodologies, conceptual frameworks, and/or data gathering and analytic techniques. Proposals should reflect relevant advances in quantitative, qualitative, and mixed-methods research and evaluation methodologies and provide a compelling argument about how the methodologies proposed are appropriately matched with the strategic research questions of the project. Additionally, proposals should demonstrate how the methods chosen will result in rigorous, cumulative, reproducible, and usable findings to merit peer-review and publication.

Broadening Participation Research proposals must include PIs with demonstrable expertise in education research and/or social science research methods and knowledge about STEM programs at HBCUs. Proposers are encouraged to establish collaborations to strengthen the research project and to describe in the proposal the nature of the collaboration and the anticipated benefits. As appropriate, proposals should describe mechanisms to effectively and efficiently transfer findings into educational practice for use by other researchers and policymakers.

3. RESEARCH INITIATION AWARDS: Projects of up to two years to perform scientific research and develop a STEM research program at the institution.

Research Initiation Awards provide support for a STEM faculty member at the HBCU to pursue research at the home institution, at an NSF-funded Center, at a research intensive institution or at a national laboratory. The project description should contain all of the elements of a standard NSF research proposal. The project should help to further the faculty member's research capability and effectiveness, to improve research and teaching at his or her home institution, and to involve undergraduate students in research experiences. Research Initiation Awards are for junior faculty who are starting to build a research program, as well as for mid-career faculty who may have returned to the faculty ranks after holding an administrative post or who for some other reason need to redirect and rebuild a research program or need to build a research program. Faculty members who hold an active research award are not eligible for the Research Initiation Award.

4A. IMPLEMENTATION PROJECTS: Projects up to five-years on institution-wide, undergraduate STEM education and research capacity building and improvement.

Implementation Projects provide support to design, implement, study and assess comprehensive institutional efforts to increase the numbers of students and the quality of their preparation by strengthening STEM education and research. Implementation projects create and/or adapt and assess innovative models and materials for teaching and learning in STEM, embody knowledge about how students learn most effectively in STEM teaching and learning activities, and bring STEM disciplinary advances into the undergraduate experience. Proposers are encouraged to analyze the strengths and potential of the institution in STEM. Based on this analysis they should design innovative educational strategies, appropriate in content and context to increase the capacity and effectiveness of the institution to attract, retain, educate, and train underrepresented minority students in STEM who are prepared to succeed in graduate school or the workforce. The students should graduate prepared competitively to go on to graduate school or the workforce. Transferability and dissemination of successful models, effective methods, and innovative materials for educating undergraduate STEM students are critical aspects of implementation projects.

Implementation Projects undertake comprehensive institutional reform and transformational strategies to strengthen and enhance STEM teaching and learning and to improve student access and retention in STEM areas. The components of the implementation design should comprise research-based or evidence-based practices and strategies to produce significant improvements in undergraduate STEM education and research programs at the institution. Project components may include, but are not limited to: developing and assessing innovative STEM curriculum teaching and learning techniques; using cyberinfrastructure for anytime, anywhere, anyone learning; providing novel undergraduate student development activities and educational enrichment services; enhancing undergraduate student research experiences; providing activities that promote the development of a globally engaged workforce, including international research experiences for undergraduate students and faculty; creating new approaches to recruitment and retention of undergraduate STEM students; providing faculty professional development in effective STEM teaching, pedagogy, and research; preparing K-12 STEM teachers; addressing the critical transitions from K-12 to undergraduate, 2-year to 4-year, and undergraduate to graduate; preparing students to compete successfully for graduate research fellowships such as the NSF Graduate Research Fellowship; and implementing other activities that enhance the quality and competitiveness of undergraduate STEM programs. The recruitment and retention of veterans in STEM fields as a means to diversify and increase the STEM workforce is encouraged.

NSF expects that the activities and strategies included in Implementation Project proposals will be consistent with and complementary to the institution's STEM needs, long-term goals, and mission. Therefore, NSF allows maximum flexibility in the design of Implementation Projects under HBCU-UP. However, the proposal must fully substantiate the rationale for choosing the desired approach. The project scope should depend on the size and number of STEM departments or programs at the institution and be defined by the complexity of the proposed activities in the project design. Ideally, the implementation project would impact all the STEM undergraduate programs, STEM students, and STEM faculty at the institution. The project plan should be clearly described, detailing measurable outcomes for STEM students (e.g. number and types of high quality research experiences, number going on to graduate school or the workforce) and faculty of the proposed HBCU-UP activities. The proposal should include compelling arguments for why these practices and strategies implemented in the specific institutional environment are expected to result in the anticipated outcomes. The proposal also should include activities for scholarly dissemination of project results and processes to inform the broader community about the effectiveness of specific implementation strategies.

If an institution has previously received an Implementation Project grant, it is critical that the proposal for another Implementation Project provide complete information on the outcomes and impact of the previous HBCU-UP project, including a description of what was learned from the previous activities, how these findings were disseminated to the broader community, and how successful activities are being sustained at the institution. Implementation proposals from past awardees must not simply propose to continue the activities of the previous Implementation Project grant. The new proposal should be based on a thorough evaluation of the previous HBCU-UP project and an assessment of the current state of the institution so that a new project can build on progress and achievements and identify new innovations to be realized to move the institution to the next level of STEM program competitiveness. The proposal should include a component that outlines a strategy for the creative integration of NSF-funded awards at the institution that are related to the proposed project's goals and scope.

4B. ACE IMPLEMENTATION PROJECTS: Five-year, institution-wide, sustainable and potentially transformative projects that advance STEM education and research.

Institutions that have had previous Implementation Project grants should be able to exhibit an established foundation and to evidence institutionalized achievements toward the HBCU-UP goals and objectives. As a result, growth in competitiveness and excellence of these HBCU-UP institutions should be clearly evidenced in the readiness of faculty, staff, infrastructure, fiscal and operations management, and institutional leadership to move to the next level of excellence. The Achieving Competitive Excellence (ACE) Implementation Project track is intended for HBCUs exhibiting these qualities as a result of previous Implementation Project grants. ACE HBCU-UP institutions are exemplars because of their consistent academic achievement in the STEM community. The goal of the ACE program is to help institutions to build the capacity to move onto the national landscape in undergraduate STEM education and research. ACE projects are ambitious, potentially transformative proposals that have the promise of significant advances in STEM undergraduate education at the institution. ACE projects should create more and varied pathways to success for STEM students by increasing intellectual and evidence-based resources. Possible approaches might include: establishing new collaborations and alliances with public and private research institutions, centers, and national laboratories; providing access to tomorrow's science through computationally intensive tools and global networks; establishing international collaborations to enhance undergraduate student and faculty research; or increasing fiscal resources for frontier STEM education and research through innovative institutional integration, leveraging partnerships, and strong linkages with business and industry. Institutions submitting an ACE Implementation Project must include a component that outlines a strategy for the creative integration of NSF-funded awards at the institution that are related to the proposed project's goals and scope, and that describes how the institution thinks strategically about moving forward in STEM education and research.

5. OTHER FUNDING OPPORTUNITIES

HBCU-UP also funds Conferences, Symposia, and Workshops; EArly-concept Grants for Exploratory Research (EAGER) and Grants for Rapid Response Research (RAPID); and Grant Supplements for existing awards. Such proposals may be submitted, as described in the Grant Proposal Guide (GPG), which is available at http://www.nsf.gov.

- For Conferences, Symposia, and Workshops, see GPG, II.D.8.
- For Early-concept Grants for Exploratory Research (EAGER), see GPG II.D.2
- For Grants for Rapid Response Research (RAPID), see GPG, II.D.1.

HBCU-UP funds planning grants of twelve to eighteen months to undertake an institutional STEM program self-analysis in preparation for submittal of an implementation project. Planning grants are also accepted for institutions who want to undertake an analysis in preparation of a submittal of a Center grant or institutional transformation grant to other NSF divisions to study institutional preparedness and to set up the needed collaborations among stakeholders. Planning grants are submitted as unsolicited proposals. PIs are advised to discuss the planning grant proposal with a program director before submission.

III. AWARD INFORMATION

HBCU-UP Proposals: (pending the availability of funds)

1) Targeted Infusion Projects

- Number of awards: Up to 15 in FY 2014 and up to 15 in FY 2015
- Project Length: From two to three years
- Award size: Up to $400,000
- Grant Administration: Targeted Infusion Projects will be managed by NSF as continuing or standard grants

2) Broadening Participation Research Projects

- Number of awards: Up to 6 in FY 2014 and up to 6 in FY 2015
- Project Length: Up to three years
- Award Size: Up to $350,000
- Restrictions: Equipment costs are not normally allowed under Broadening Participation Research Projects
- Grant Administration: Broadening Participation Research Projects will be managed by NSF as continuing or standard grants

3) Research Initiation Awards

- Number of awards: Up to 20 in FY 2015
- Project Length: Up to two years
- Award Size: Up to $200,000
- Restrictions: Equipment cost may not exceed 20% of the total budget
- Grant Administration: Research Initiation Awards will be managed by NSF as standard grants

4A) Implementation Projects

- Number of awards: Up to 6 in FY 2014 and up to 6 on FY 2015
- Project Length: Up to 4 years for 1st round implementation project; up to five years for 2nd and 3rd round implementation projects
- Award Size: Up to $1 million for 1st round implementation projects; up to $1.75 million for 2nd and 3rd round implementation projects
- Restrictions: Equipment costs may not exceed 30% of the total budget request
- Grant Administration: Implementation Projects will be managed by NSF as continuing grants

4B) ACE Implementation Projects

- Number of awards: Up to 2 in FY 2014 and up to 2 in FY 2015
- Project Length: Up to five years
- Award Size: Up to $3 million
- Restrictions: Equipment costs may not exceed 30% of the total budget request
- Grant Administration: ACE Implementation Projects will be managed by NSF as continuing grants

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- **HBCU-UP Proposals:** Historically Black Colleges and Universities (HBCUs) that are accredited and offer undergraduate educational degree programs in science, technology, engineering and mathematics (STEM).

PI Limit:

- The Principal Investigator for a **Targeted Infusion Project** should be the individual who will direct the implementation of the project activities.
- The Principal Investigator for a **Broadening Participation Research Project** should be responsible for managing the project and should be one of the key researchers. At least one of the Principal Investigators must have experience in education or social science research.
- The Principal Investigator for a **Research Initiation Award** should be a faculty member in a STEM discipline at the HBCU. Co-Principal Investigators and senior personnel are not permitted.

- The Principal Investigator and co-Principal Investigators for the **Implementation Project and ACE Implementation Project** should be the key personnel that will be responsible for guiding the implementation of the project.

Limit on Number of Proposals per Organization:

HBCU-UP Proposals:

- An eligible institution can only submit one Implementation Project or ACE Implementation Project proposal and can only have one active Implementation Project or ACE Implementation Project award.
- An eligible institution can submit no more than two Broadening Participation Research proposals per year.
- An eligible institution can submit no more than two Targeted Infusion Project proposals per year and can only have one active Targeted Infusion Project for any given department.
- An eligible institution can submit no more than two Research Initiation Award proposals per year.

Limit on Number of Proposals per PI or Co-PI: 2

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent *(required)*:

Letters of intent are required for HBCU-UP.

All Letters of Intent must be submitted via FastLane. A separate letter of intent is requested for each Targeted Infusion Project, Broadening Participation Research Project, Research Initiation Award or Implementation/ACE Implementation Project proposal that will be submitted from an eligible institution.

Letters of intent must contain the following information:

- The type of proposal that will be submitted (Targeted Infusion Project, Broadening Participation Research Project, Research Initiation Award or Implementation/ACE Implementation Project)
- Project title
- PI name and Co-PI names, department, institution, phone, fax and email
- Point of contact should be the PI
- Submitting institution's name
- Project synopsis: Implementation and ACE Implementation Projects should propose research-based/evidenced-based strategies or practices that could enhance undergraduate STEM education and research at the institution. A brief description of the proposed activities should be provided with an explanation as to why they should be successful in that institutional environment and setting. The expected effects, outcomes, and impact targets and timelines from the implementation project should be summarized. Broadening Participation Research Projects should describe the type of knowledge to be produced. The theoretical framework, the research question(s) to be addressed, the population(s) to be examined, and the data to be gathered should be provided. A brief description of the research design, methods and procedures for the study should be given. Targeted Infusion Projects should provide a brief description of the proposed activities, expected outcomes, and timelines. Research Initiation Awards should provide a brief description of the proposed research.
- Research Initiation Award letters of intent should list only the PI under Senior Project Personnel.

Technical assistance will be offered by HBCU-UP program officers to proposers who submit a letter of intent by the due date.

Letter of Intent Preparation Instructions:

When submitting a Letter of Intent through FastLane in response to this Program Solicitation please note the conditions outlined below:

- Sponsored Projects Office (SPO) Submission is required when submitting Letters of Intent
- A Minimum of 1 and Maximum of 4 Other Senior Project Personnel are allowed
- Proposal Type is required when submitting Letters of Intent
- Submission of multiple Letters of Intent is allowed

Full Proposal Preparation Instructions: Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the

Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. Chapter II, Section D.4 of the Grant Proposal Guide provides additional information on collaborative proposals.

Important Proposal Preparation Information: FastLane will check for required sections of the full proposal, in accordance with *Grant Proposal Guide* (GPG) instructions described in Chapter II.C.2. The GPG requires submission of: Project Summary; Project Description; References Cited; Biographical Sketch(es); Budget; Budget Justification; Current and Pending Support; Facilities, Equipment & Other Resources; Data Management Plan; and Postdoctoral Mentoring Plan, if applicable. If a required section is missing, **FastLane will not accept the proposal.**

Please note that the proposal preparation instructions provided in this program solicitation may deviate from the GPG instructions. If the solicitation instructions do not require a GPG-required section to be included in the proposal, insert text or upload a document in that section of the proposal that states, "Not Applicable for this Program Solicitation." Doing so will enable FastLane to accept your proposal.

For HBCU-UP PROJECTS

- COVER SHEET-
  - For all HBCU-UP proposals under "NSF Unit Consideration" please select:
    - "HRD-Division of Human Resource Development" as the division
    - "Hist Black Colleges and Univ" as the program
  - Targeted Infusion Project proposals:
    - Please begin the project title with "Targeted Infusion Project:"
  - Broadening Participation Research proposals:
    - Please begin the project title with "Broadening Participation Research Project:"
  - Research Initiation Award proposals:
    - Please begin the project title with "Research Initiation Award:"
  - Implementation proposals:
    - Please begin the project title with "Implementation Project:"
  - ACE Implementation proposals:
    - Please begin the project title with "ACE Implementation Project:"

Review the regulations regarding Human Subjects (45 CFR 690.101-124 http://www.nsf.gov/bfa/dias/policy/human.jsp). This is particularly important for Broadening Participation Research Projects. Please note that Human Subjects regulations also govern activities that have to do with safeguarding individually identifiable information such as student and faculty surveys and data. Therefore many Implementation Projects and possibly Targeted Infusion Projects may need to be reviewed by the Human Subjects Internal Review Board (IRB) for the institution. If the project will be IRB reviewed, please indicate on the cover sheet that the review is pending. If the proposal has already been IRB reviewed and found to be exempt, please indicate so on the cover sheet. If the IRB has already given approval of the activities include a letter from the IRB and indicate the expiration date of the IRB approval on the cover sheet. Please note that an award cannot be made unless the IRB process has been completed and documentation has been received by the program director prior to recommending the award.

REQUIRED COMPONENTS FOR ALL PROPOSALS

- PROJECT SUMMARY - Each proposal must contain a summary of the proposed project not more than one page in length. The Project Summary consists of an overview, a statement on the intellectual merit of the proposed activity, and a statement on the broader impacts of the proposed activity. The overview includes a description of the activity that would result if the proposal were funded and a statement of objectives and methods to be employed. The statement on intellectual merit should describe the potential of the proposed activity to advance knowledge. The statement on broader impacts should describe the potential of the proposed activity to benefit society and contribute to the achievement of specific, desired societal outcomes. The Project Summary should be written in the third person, informative to other persons working in the same or related fields, and, insofar as possible, understandable to a scientifically or technically literate lay reader. It should not be an abstract of the proposal. **Proposals that do not contain the Project Summary, including an overview and separate statements on intellectual merit and broader impacts will not be accepted by FastLane or will be returned without review.**
- PROJECT DESCRIPTION - 15 page limit. The Project Description must contain, as a separate section within the narrative, a discussion of the broader impacts of the proposed activities. Refer to the "Project Description" section below for more information on each type of HBCU-UP proposal: 1) Targeted Infusion Projects, 2) Broadening Participation Research Projects, 3) Research Initiation Awards and 4) Implementation Projects and ACE Implementation Projects.
- REFERENCES CITED - Provide the references cited in the proposal.
- BIOGRAPHICAL SKETCHES - Outline the experiences of the PI and co-PIs (two-page limit each person) using the GPG guidelines.
- BUDGET - Follow the directions in the Grant Proposal Guide and refer to section B. Budgetary Information of this document.
- CURRENT AND PENDING SUPPORT- Use the formats provided in FastLane or Grants.gov. Enter this proposal as pending support.
- FACILITIES, EQUIPMENT & OTHER RESOURCES - Provide a description of available facilities and priorities for their use, if applicable. Please note that this section is a required part of the proposal. If not applicable, the proposer should enter "Not applicable" in the Facilities, Equipment, and Other Resources section of the proposal.
- DATA MANAGEMENT PLAN - Must be included as a supplementary document.
- POSTDOCTORAL RESEARCHER MENTORING PLAN - Must be included as a supplementary document if funding to support a postdoctoral researcher is requested.
- UNDERGRADUATE STUDENT MENTORING PLAN - HBCU-UP requires that each proposal that requests funding to support undergraduate students must include, as a supplementary document, a description of the mentoring activities that will provided for such individuals.

PROJECT EVALUATION

All proposals (except for Research Initiation Awards) should include an evaluation section that describes how the project evaluator/evaluation team will determine the accomplishment of project goals and the impact of the project. Evaluation should be based on benchmarks, indicators, or expected outcomes related to project goals and activities. Evaluation plans should be based on a Logic

Model or other tool that relates project goals to activities and to outputs, outcomes, and impact (immediate, short-term, and intermediate-term expected changes). Most evaluations are based on evaluation questions that relate to program and project goals. Evaluation plans should be appropriate to the scope of the project; this usually includes both formative and summative evaluations. Formative evaluation plans outline methods for documenting progress toward project goals and should include a feedback feature that allows for continuous improvement of the project activities. In some cases, formative evaluation may be internal to the project. Summative evaluation focuses on the influence of the project on the targeted expected outputs and outcomes and over-all impact of the project. Some projects will utilize experimental or quasi-experimental designs as the basis for their summative evaluation plans.

Evaluations are expected to include both qualitative and quantitative methodology. Expected project outputs, outcomes and impact should be included in the evaluation plan and should, when possible, rely on measures that are valid and reliable with the targeted participants. Outputs are the numbers related to project activities such as the number of faculty in pedagogical workshops, the number of students who attended a summer STEM orientation, or the number of peer-reviewed publications attributed to the project. Outcomes are defined as the results of participation in project activities. Strategic impacts are lasting outcomes attributable to the project. The demonstration of project impact is the result of the overall influence of the project on the goal of the program. An example of impact is increased graduation rates of students who participated in a specific model compared to baseline or a control/comparison group.

Evaluation for research projects is expected to be appropriate for research. Evaluation plans for research projects could include activities related to project integrity and usefulness / utilization / and dissemination of findings. Evaluation activities could include such activities as documenting and describing the operation of the project through all phases and oversight related to appropriate selection of participant, fidelity, and integrity of research design and measures (formative); and assessing the extent to which findings contribute to the knowledge base in the field and are disseminated to those researchers and practitioners who will utilize the findings (summative).

The budget MUST include adequate resources for project evaluation. Project evaluation should be led by an expert independent evaluator. Evaluators are expected to adhere to the Guiding Principles for Evaluators (http://www.eval.org/), and project evaluations are expected to be consistent with standards established by the Joint Committee on Standards for Educational Evaluation (http://www.jcsee.org/).

The following references may be helpful in designing an evaluation plan:

- *Mixed Methods User-Friendly Handbook: http://www.westat.com/Westat/pdf/news/UFHB.pdf*
- *Framework for Impact of BP Projects: http://www.nsf.gov/od/broadeningparticipation/framework-evaluating-impacts-broadening-participation-projects_1101.pdf*
- *Framework for Impact of ISE Projects: http://informalscience.org/research/ic-000-000-003-730/Framework_for_Evaluating_Impacts_of_ISE_Projects*
- *AAAS Measuring Diversity Report: http://www.nsfagep.org/files/2011/04/MeasuringDiversity-EvalGuide.pdf*
- *Evidence: An Essential Tool Report: http://www.nsf.gov/pubs/2005/nsf0531/nsf0531.pdf*
- *Indigenous Evaluation Framework Report: http://portal3.aihec.org/sites/Indigeval/Documents/0-Intro_Contents.pdf*
- *Evaluation e-library of the American Evaluation Association Resource Library http://www.eval.org/*

ADDITIONAL GUIDELINES PERTINENT TO EACH HBCU-UP TRACK

1) Targeted Infusion Projects - The project description should include the following information:

Background and Context

- Describe the overall goal of the project. The goal must be clearly stated, measurable, and achievable within the proposed time line.
- Describe the benefits of achieving the goal to STEM education and research at the institution.
- Baseline data should be included in order to provide the context for the impact of the Targeted Infusion Project.
- Provide information on the extent of the use of evidence-based instructional practices in the department(s) involved in the proposed project. Be specific as to what these practices are, in what departments and specific courses they are employed, and how many students are typically enrolled in these courses.

Proposed Activities

- Describe the specific activities that will be undertaken in order to achieve the goal.
- Since institutions have different policies and procedures, such as for new degree program approval, explain how the project timelines reflect all institutional requirements. If appropriate, include evidence (such as letters of support) that indicate that institutionally required procedures are being followed and preliminary approvals have been secured.
- Equipment and supplies:
  - Explain how recurring costs, such as lab supplies for a newly created laboratory course, will be supported after the project ends.
  - Quotes or estimates for major equipment purchases should be included in the supplementary documents section.
  - Explain how long-term maintenance of new equipment will be supported after the project ends.

Dissemination

- Describe plans to communicate the results and outcomes of the project to other professionals in STEM education and research, both during and after the project. Describe the information to be disseminated, the means of dissemination, and the procedures for determining the success of the dissemination effort.

Project Management

- Provide a management plan for the project that will ensure that the activities and the required reporting will be implemented on time and within budget.
- Provide a timeline for the activities to be implemented - include measurable objectives and outcomes and the staff that are responsible for carrying out the activities.

Project Evaluation

- It is expected that each Targeted Infusion proposal will include a formative and summative evaluation plan. The evaluation plan should refer to the objectives, goals and baseline data presented within the description of the proposed Targeted Infusion Project activities. The formative evaluation should include benchmarks and indicators of progress to assess the Targeted Infusion Project. The summative evaluation should assess whether the Targeted Infusion Project achieved the

overall goals, as well as identify any unexpected results. The evaluator should be someone external to the project.

2) Broadening Participation Research Projects - The project description should include the following information:

Background and Context

- Describe the research question(s) to be investigated and explain the significance and importance of answering the proposed research question(s). Discuss the base of research/theory that motivates the question(s).
- Explain how the project will contribute to the knowledge base of broadening participation research and how it has the potential to be replicated at other HBCUs and other institutions seeking to increase the success of underrepresented students in STEM.

Proposed Research Activities

- Describe the research plan (design, data collection, data analysis, etc.) that will be undertaken to answer the research question(s).
- Address the validity and reliability of new or previously validated survey instruments.
- Provide a timeline for the research plan - include measurable objectives and outcomes and identify who will be responsible for completing each task.
- Study of a promising intervention and effectiveness studies are permitted.
- In general, implementation activities are not recommended under Broadening Participation Research Projects. In some cases, implementation activities may be appropriate, but these activities must clearly be required in order to answer the proposed research question(s) and must be significantly different from implementation activities undertaken in other projects. If implementation activities are included, clearly explain why the activities are needed to answer the research question(s).

Dissemination

- Describe detailed plans to communicate the results and outcomes of the project to other professionals in STEM education and research and the higher education community, both during and after the project. Describe the information to be disseminated, the means of dissemination, and the procedures for determining the success of the dissemination effort.

Project Management

- Provide a management plan for the project that will ensure that the activities and the required reporting will be implemented on time and within budget.
- At least one of the PIs on the project must have formal training or significant professional experience in education or social science research.

Project Evaluation

- It is expected that each Broadening Participation Research proposal will include an evaluation plan that includes benchmarks and quantitative and qualitative indicators of progress of the research project. The plan should address the assessment of project outcomes and contributions to the research knowledge base and/or educational practice. The evaluator should be someone external to the project.

3) Research Initiation Awards - In addition to following the general format for research proposals as described in the GPG, Research Initiation Award (RIA) proposals submitted must also adhere to the following special instructions:

It is the responsibility of the PI to find a research collaborator at the home institution, an NSF funded research center, such as a Center for Research Excellence in Science and Technology, Engineering Research Center, Materials Research Science and Engineering Center, Physics Frontier Center, Science and Technology Center, Science of Learning Center; at a national laboratory; or with a research group at a research university. The PI could conduct research during the summer months at the research collaborator's site (if it is not the home institution) and make arrangements for continuing the research during the academic year at his or her home institution. Support can be provided for release time during the academic year, summer salary for the PI, travel and housing at the research site for the PI and undergraduate students, and stipends for undergraduate student research experiences.

Project Summary (one-page limit):

- Provide a succinct summary of the intellectual merit of the proposed project Describe the broader impacts of the proposed work, including benefits to society, dissemination of work, enhancements to scientific knowledge, as well as how the proposed activity will broaden participation of underrepresented groups.

Project Description (15 page limit, including tables, figures, and other visual supplements):

Provide a detailed statement of the proposed research to be undertaken. It should contain:

- A brief description of the PI's overall research and education goals.
- A detailed description of the proposed research activities including any preliminary data already available and a description of data that the PI plans to obtain.
- The relationship of the proposed activities to the PI's projected longer term research goals.
- A discussion of how those activities will benefit the research capacity at the institution.
- A discussion of how undergraduate students will be involved in this research.
- A plan for dissemination of this research.

Special Information and Supplementary Documentation:

Include the following:

- A letter of commitment from the PI's Department Chair or Dean stating that the PI will have institutional support in terms of allowance for release time, travel for research purposes, and access to existing research facilities.
- A mentoring plan for the PI from the Department Chair or Dean.
- A letter of support from the PI's research collaborator.
- A research mentoring plan for the PI from the research collaborator.
- A mentoring plan from the PI for the undergraduate students that are involved in the project.

4A) Implementation Projects - Implementation Projects should be about creating or adapting and implementing, studying, and assessing evidence-based practices that strengthen and enhance STEM teaching and learning and increase productivity and

outcomes from STEM undergraduate programs. The relevant research or knowledge base that supports the effectiveness of the efforts selected should be included with compelling arguments as to why these strategies are expected to result in the anticipated outcomes at the institution.

4B) ACE Implementation Projects: This highly competitive track is for accomplished HBCU-UP institutions that are exemplars because of their consistent academic achievement in the HBCU STEM community. The proposals for this track are ambitious, potentially transformative, and have the promise of significant advances in STEM undergraduate education at the HBCU. The goal of the ACE program is in helping these institutions to excel and moving the HBCU-UP portfolio forward.

The project description should address the following elements:

Background and Context

- State the problem(s) to be addressed.
- Articulate current knowledge of the problem(s) and some of the causes as understood from documented sources.
- Provide information on the institution's current STEM education and research capability (baseline data). Examples of information and data include: a description of STEM degree programs, student enrollment, retention, graduation rates, number of students going to graduate schools, gatekeeper course performance, STEM faculty demographics, and STEM infrastructure resources at the institution and collaborating organizations.
- Provide information on the extent of the use of evidence-based instructional practices in STEM degree programs at the institution. Be specific as to what these practices are, in what departments and specific courses they are employed, and how many students are typically enrolled in these courses.
- Describe prior efforts and results of those efforts. Provide information on STEM-related programs that have been implemented or are currently active. This should include previous HBCU-UP awards and awards from other NSF programs, other federal programs, state programs, and institution programs. Explain the outcomes from these efforts. Institutions that have received an HBCU-UP Planning Grant must describe the planning grant activities and the findings of those activities.
- Identify the areas that have not been understood, determined, verified, tested, or resolved by previous efforts. Highlight some of the areas that need improvement and that will be addressed with the proposed project activities.

Goals and Objectives

- Clearly state the goals and objectives of the project.
- Describe the information and knowledge that will be obtained from the project.
- Describe the expected results and student outcomes.
- Explain the expected significance of the project and the compatibility with the mission and environment of the institution.

Detailed Project Plan

- Describe the research-based or evidence-based practices selected for implementation and why and how they could improve undergraduate STEM education at the institution and under the present setting and conditions.
- As necessary, describe the demographic, social, cultural, political, and economic environment in which the project is situated and how this environment may affect implementation, operations, and results. Describe adjustments that must be made to adapt the documented practices and strategies of this project to the environment.
- Implementation Design: Present the conceptual model of the project and describe each of the components (i.e. each of the educational activities and interventions being implemented) and their links to the project goals and objectives.
- Implementation/Intervention Study: Define the procedures and methods for analyzing and assessing each of the educational activities and interventions of the project in producing the desired effects.
- Define the expected measurable outcomes and explain the relationships with the components of the implementation linked to project goals and objectives. Include indicators and benchmarks with timelines that will determine which implementation strategies are proving to be effective in the environment.

Dissemination

- Describe plans to communicate the results and outcomes of the project to other professionals in STEM education and research, both during and after the project. Describe the information to be disseminated, the means of dissemination, and the procedures for determining the success of the dissemination effort.

Project Management Plan

- Implementation of evidence-based practices and programs almost always requires organizational change. Define the organizational structure for the project and explain its institutional alignment for achieving the project goals and objectives. Define the roles and responsibilities of key personnel who will carry out project activities.
- Define the processes and systems that will be applied to operate the project, including budget management, data management and reporting.
- Define the plans for sustainability or institutionalization of any project components.
- The Principal Investigator should be an academic leader with the authority to lead a project that crosses several STEM schools, departments, or units. The co-Principal Investigators should be STEM academic leaders, scientists, and faculty members who carry-out the project work plan. Implementation Projects should have an Internal Steering Committee or Internal Advisory Committee to help manage the project implementation, resolve project issues, and ensure that the project is on track for meeting project goals. Implementation Projects also should have an External Advisory Committee that meets at least once a year.
- Define the commitment of institutional leadership to the implementation process. Provide evidence of the commitment to the proposed Implementation Project activities from the institutional administration, STEM leadership and faculty, and other partners and collaborators, as applicable. Substantive letters of commitment to the proposed project activities can be included as supplementary documents. General letters of support from individuals not involved in the implementation of project activities should not be included.

Evaluation plan

- Provide a formative evaluation plan with strategies to monitor operations and activities of the project as they evolve and to inform and guide these efforts.
- Describe the criteria to be used in evaluating the quality and impact of the project and the process for collecting and analyzing information at the institution.
- Provide a summative evaluation plan with strategies to assess the effectiveness and impact of the project in achieving its goals and for identifying positive and negative findings when the project is completed.
- Include the capability statement and credentials of the external evaluator as supplementary documents.

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

Other Budgetary Limitations:

- Equipment Limitations:
    - Broadening Participation Research Projects - Broadening Participation Research Projects are not intended to support implementation activities; therefore major equipment is not normally included. However, minimal equipment costs are allowed if required to perform the research activities.
    - Research Initiation Awards - Equipment cost cannot exceed 20% of the total budget.
    - Implementation Projects and ACE Implementation Projects - Equipment costs cannot exceed 30% of the total NSF budget requested.
- Required Meeting Travel: All proposals should budget for the PI to attend a two to three day meeting of HRD grantees in the Washington, DC area every even-numbered year of the project. Every odd-numbered year, this meeting will be a shorter (one to two day) event, focused on the issues of HBCU-UP grantees. These shorter meetings may be virtual.
- Financial support may be provided to student participants under HBCU-UP projects. However, financial support may only be provided to students that are U.S. citizens, nationals, or permanent residents. Student support should be included on the "Stipends" line under the "Participant Support Costs" section of the budget. Stipends to undergraduate students should not replace other need based grants and scholarships already awarded to the students.

C. Due Dates

- **Letter of Intent Due Date(s)** *(required)* (due by 5 p.m. proposer's local time):

    December 18, 2013

        Letters of Intent are due for Targeted Infusion Projects, Broadening Participation Research Projects, Achieving Competitive Excellence Implementation Projects and Implementation Projects

    August 25, 2014

        Letters of Intent are due for Research Initiation Awards

    November 24, 2014

        Letters of Intent are due for Targeted Infusion Projects, Broadening Participation Research Projects, Achieving Competitive Excellence Implementation Projects and Implementation Projects

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):

    February 18, 2014

        Proposals are due for Targeted Infusion Projects, Broadening Participation Research Projects, Achieving Competitive Excellence Implementation Projects and Implementation Projects

    October 27, 2014

        Proposals are due for Research Initiation Awards

    January 26, 2015

        Proposals are due for Targeted Infusion Projects, Broadening Participation Research Projects, Achieving Competitive Excellence Implementation Projects and Implementation Projects

D. FastLane/Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

    Detailed technical instructions regarding the technical aspects of preparation and submission via FastLane are available at: https://www.fastlane.nsf.gov/a1/newstan.htm. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

    Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane Website at: https://www.fastlane.nsf.gov/fastlane.jsp.

- **For Proposals Submitted Via Grants.gov:**

    Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: http://www07.grants.gov/applicants/app_help_reso.jsp. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

Submitting the Proposal: Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program for acknowledgement and, if they meet NSF requirements, for review. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF either as *ad hoc* reviewers, panelists, or both, who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal. In addition, Program Officers may obtain comments from site visits before recommending final action on proposals. Senior NSF staff further review recommendations for awards. A flowchart that depicts the entire NSF proposal and award process (and associated timeline) is included in the GPG as Exhibit III-1.

A comprehensive description of the Foundation's merit review process is available on the NSF website at: http://nsf.gov/bfa/dias/policy/merit_review/.

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in *Empowering the Nation Through Discovery and Innovation: NSF Strategic Plan for Fiscal Years (FY) 2011-2016*. These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

One of the core strategies in support of NSF's mission is to foster integration of research and education through the programs, projects and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students, and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the variety of learning perspectives.

Another core strategy in support of NSF's mission is broadening opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in STEM disciplines, which is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

A. Merit Review Principles and Criteria

The National Science Foundation strives to invest in a robust and diverse portfolio of projects that creates new knowledge and enables breakthroughs in understanding across all areas of science and engineering research and education. To identify which projects to support, NSF relies on a merit review process that incorporates consideration of both the technical aspects of a proposed project and its potential to contribute more broadly to advancing NSF's mission "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." NSF makes every effort to conduct a fair, competitive, transparent merit review process for the selection of projects.

1. Merit Review Principles

These principles are to be given due diligence by PIs and organizations when preparing proposals and managing projects, by reviewers when reading and evaluating proposals, and by NSF program staff when determining whether or not to recommend proposals for funding and while overseeing awards. Given that NSF is the primary federal agency charged with nurturing and supporting excellence in basic research and education, the following three principles apply:

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These "Broader Impacts" may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be accountable for carrying out the activities described in the funded project. Thus, individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

These three merit review principles provide the basis for the merit review criteria, as well as a context within which the users of the criteria can better understand their intent.

2. Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board approved merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two merit review criteria are listed below. **Both** criteria are to be given **full consideration** during the review and decision-

making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria. (GPG Chapter II.C.2.d.i. contains additional information for use by proposers in development of the Project Description section of the proposal.) Reviewers are strongly encouraged to review the criteria, including GPG Chapter II.C.2.d.i., prior to the review of a proposal.

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to
    a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
    b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education.

Proposers are reminded that reviewers will also be asked to review the Data Management Plan and the Postdoctoral Researcher Mentoring Plan, as appropriate.

Additional Solicitation Specific Review Criteria

For HBCU-UP: In addition to the two NSF criteria for Intellectual Merit and Broader Impacts, special review criteria for Implementation and ACE Implementation projects are:

- Does the proposal describe a convincing rationale and appropriate methods for the project activities that are research-based/evidence-based?
- Are the project design and methods linked to measureable outcomes and are they appropriate to the scope, scale, and setting for the project?
- Is the project likely to produce high quality results that contribute to the undergraduate STEM education knowledge base?
- Is the project likely to have an impact on STEM education, student learning, and faculty practice?
- Is the project management plan adequate and does it include clear roles and responsibilities of the personnel who will contribute to the project?
- Is there commitment of the leadership to the implementation process?
- Does the evaluation plan define indicators and benchmarks to inform the project team and others about the operations and effectiveness of the implementation?
- Does the project have a plan for effective and scholarly dissemination of results?

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or Panel Review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (GC-1); * or Research Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the NSF *Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

Special Award Conditions:

Reverse Site Visits: Participation in a Reverse Site Visit (RSV) can be requested by NSF at any time during the grant period. The RSV is a presentation on the outcomes and progress of the grant activities at NSF in front of a peer review panel. Participation in the RSV is required by the appropriate grant management team and institutional administration.

Site Visits: NSF staff may visit the site of the grant project at anytime during the grant period. Reasonable accommodation of the site visit by NSF program staff is required by the grantee.

Cooperation with NSF evaluation projects and special projects: NSF, an NSF contractor, or a grantee on behalf of NSF, may from time to time conduct program evaluations or special projects of HBCU-UP projects. These may occur at anytime during the grant period and sometimes after the grant period has ended. Reasonable cooperation with these efforts is required by the grantee.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer at least 90 days prior to the end of the current budget period. (Some programs or awards require submission of more frequent project reports). Within 90 days following expiration of a grant, the PI also is required to submit a final project report, and a project outcomes report for the general public.

Failure to provide the required annual or final project reports, or the project outcomes report, will delay NSF review and processing of any future funding increments as well as any pending proposals for all identified PIs and co-PIs on a given award. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through Research.gov, for preparation and submission of annual and final project reports. Such reports provide information on accomplishments, project participants (individual and organizational), publications, and other specific products and impacts of the project. Submission of the report via Research.gov constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report also must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

More comprehensive information on NSF Reporting Requirements and other important information on the administration of NSF awards is contained in the NSF *Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

VIII. AGENCY CONTACTS

Please note that the program contact information is current at the time of publishing. See program website for any updates to the points of contact.

General inquiries regarding this program should be made to:

- Claudia Rankins, Program Director, 815N, telephone: (703)-292-8109, fax: (703)-292-9018, email: crankins@nsf.gov

- Earnestine Easter, Program Director, 875N, telephone: (703)-292-8112, fax: (703)-292-9039, email: epsalmon@nsf.gov

- Martha James, Program Director, 815.01, telephone: (703)-292-7772, fax: (703)-292-9018, email: mjames@nsf.gov

- Toni Edquist, Program Specialist, telephone: (703)-292-4649, email: tedquist@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

IX. OTHER INFORMATION

The NSF website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this website by potential proposers is strongly encouraged. In addition, "My NSF" is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Grants Conferences. Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. "My NSF" also is available on NSF's website at http://www.nsf.gov/mynsf/.

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this new mechanism. Further information on Grants.gov may be obtained at http://www.grants.gov.

> The National Science Foundation and the Institute of Education Sciences in the U.S. Department of Education developed *Common Guidelines for Education Research and Development*. The *Guidelines* describe six types of research studies that can generate evidence about how to increase student learning. Research types include those that generate the most fundamental understandings related to education and learning; examinations of associations between variables; iterative design and testing of strategies or interventions; and assessments of the impact of a fully-developed intervention on an education outcome. For each research type, there is a description of the purpose and the expected empirical and/or theoretical justifications, types of project outcomes, and quality of evidence.

> The *Guidelines* publication can be found on the NSF website with the number NSF 13-126 (http://www.nsf.gov/pubs/2013/nsf13126/nsf13126.pdf). A set of FAQs regarding the *Guidelines* are available with the number NSF 13-127 (http://www.nsf.gov/pubs/2013/nsf13127/nsf13127.pdf). Grant proposal writers and PIs are encouraged to familiarize themselves with both documents and use the information therein in the preparation of proposals to NSF.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 55,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Arctic and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

Facilitation Awards for Scientists and Engineers with Disabilities provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

> The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.
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> To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at http://www.nsf.gov
>
> - **Location:**   4201 Wilson Blvd. Arlington, VA 22230
>
> - **For General Information**   (703) 292-5111
>   (NSF Information Center)**:**

- **TDD (for the hearing-impaired):**   (703) 292-5090

- **To Order Publications or Forms:**

    Send an e-mail to: nsfpubs@nsf.gov

    or telephone: (703) 292-7827

- **To Locate NSF Employees:**   (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Office of the General Counsel
National Science Foundation
Arlington, VA 22230

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